

PATENT COOPERATION TREATY

REC'D 08 AUG 2005

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From the
INTERNATIONAL SEARCHING AUTHORITY

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)**

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/B2005/050924

International filing date (day/month/year)
16.03.2005

Priority date (day/month/year)
29.03.2004

International Patent Classification (IPC) or both national classification and IPC
H03L7/087, H03L7/089, H03D13/00

Applicant
KONINKLIJKE PHILIPS ELECTRONICS N.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. IV Lack of unity of invention

1. ☐ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:
- ☐ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☐ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-8,13,14

Box No. V Reasoned statement under Rule 43b/s.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|-----------|
| Novelty (N) | Yes: Claims | 7,8,13 |
| | No: Claims | 1-6,14 |
| Inventive step (IS) | Yes: Claims | |
| | No: Claims | 1-8,13,14 |
| Industrial applicability (IA) | Yes: Claims | 1-8,13,14 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Of the documents cited in the International Search Report the following documents are mentioned in this communication:

- D1: US-A-6 081 572 (FILIP ET AL) 27 June 2000 (2000-06-27)
D2: US-A-6 055 286 (WU ET AL) 25 April 2000 (2000-04-25)
D3: DE 196 30 917 C1 (SIEMENS AG, 80333 MUENCHEN, DE) 26 March 1998 (1998-03-26)
D4: US-A-5 087 841 (ROGERS ET AL) 11 February 1992 (1992-02-11)

Re Item IV - Unity

1. The present application lacks unity within the meaning of Rule 13.1 PCT because 2 different inventions are claimed therein, defined by the following groups of claims:
I. Claims 1-8, 13, 14 A frequency error detector and associated method.
II. Claims 9-12, 13, 15 A charge pump and associated method.
Claim 13 belongs to both groups since it is dependant both on claim 1 and on 9.
2. According to Article 34 (3) (a) with Rule 13.1 PCT claims directed to different subject matter may be included in one and the same international patent application only if they are linked by a single, general inventive concept.
3. According to Rule 13.1 PCT the requirement of unity of invention shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression 'special technical feature' shall mean those features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art.
Since independent claims 1 and 9 share no features in common this requirement is not met; there is no single general inventive concept which links the subject matter of these different independent claims and thus the present application lacks unity within the meaning of Article 34 (3) (a) with Rule 13.1 PCT.

Re Item V - Novelty, Inventive Step or Industrial Applicability

4. The present application does not meet the criterion set forth in Article 33 (2) PCT because the subject matter of claims 1-6 and 14 is not new as explained below.
Furthermore, the requirements of Article 33 (3) PCT are not met because the subject

matter of claims 7, 8 and 13 does not involve an inventive step, see 5. below; and claim 4 lacks clarity Article 6 PCT, see 6. below.

- 4.1 Document D1 is considered the closest prior art with respect to the present application. D1 discloses a detector arrangement for detecting a frequency error between an input signal (INPUT DATA) and a reference signal (FROM VCO) with: a) first latch means (306) for sampling a quadrature component (O2) of the reference signal based on the input signal to generate a first binary signal (PD2); b) second latch means (304) for sampling an in-phase component (O1) of the reference signal based on the input signal to generate a second binary signal (PD1); and c) third latch means (504) for sampling the first binary signal based on the second binary signal to generate a frequency error signal (FD).
Hence the subject matter of independent claim 1 and corresponding independent method claim 14 is not new with respect to the disclosure of document D1.
- 4.2 The above objection could also be raised on the basis of document D2 or D3.
- 4.3 The additional features of dependent claims 2-6 are disclosed in D1 thus:
Claim 2: control means (508) for selectively suppressing operation of a charge pump circuit (summer 208) to which the first binary signal (PD2) is supplied in response to a control signal (LOCK) derived from the second binary signal (PD1).
(It is considered that 'summer' implies to presence of a current summer i.e. charge pump, since it is normal for the filter of a PLL to be preceded by a charge pump).
Claim 3: the first and second latch means each comprise a double-edge triggered flip-flop arrangement (306, 304 figure 4A).
Claim 4: each double-edge triggered flip-flop arrangement comprises first and second D-latch circuits (e.g. 408, 410) receiving the reference signal and being respectively controlled by a direct version and an inversed version of the respective component of the input signal, and a multiplexer circuit (e.g. 412) being controlled by the inversed version of the respective component (see Clarity 6. below).
Claim 5: the third latch means is a D-latch circuit (504) receiving the first binary signal (PD2) and being controlled (clocked) by the second binary signal (PD1).
Claim 6: the reference signal is a clock signal (from VCO) recovered (by PLL, figure 2) from the input signal.

Hence the subject matter of claims 2-6 is also not new.

5. The present application does not meet the requirements of Articles 33 (3) PCT since the subject matter of claims 7, 8 and 13 does not involve an inventive step.
- 5.1 In D1, the first and second binary signals (PD2, PD1) are supplied to the charge pump circuit (208) via a buffer (508). Since the purpose of a buffer is to allow transition of signals between two parts of a system without affecting either, it would be natural for one skilled in the art to consider the use of amplifiers and level shifters as needed to achieve this isolation (buffering) effect, and so the features added by claim 7 cannot be considered to be inventive.
- 5.2 Furthermore, it is known in the art that buffers may comprise a combination of a feedback amplifier and a feedforward amplifier, see for example document D4. Hence the subject matter of claim 8 does not appear to involve an inventive step with respect to the disclosure of document D1 combined with the general knowledge of the skilled person.
- 5.3 The features of dependent claim 13 are all disclosed in document D3, except that the 'frequency error signal' and 'frequency-locked state' inputs to the charge pump have been exchanged. This possibility being an obvious option for one skilled in the art, claim 13 lacks inventive step.

Re Item VIII - Clarity

6. Claim 4 lacks clarity Article 6 PCT in that the terms 'input signal' and 'reference signal' appear to have been interchanged vis-a-vis their usage in previous claims 1 and 2 (the absence of reference signs means that this cannot be verified beyond doubt at present), and it is this interpretation which has been used for assessing novelty in 4.3 above.
- For example, the first embodiment (figure 3) of the application shows first and second D-latch circuits (L1, L2) receiving the reference signal (CKQ) and being respectively

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controlled (clocked) by a direct version (+) and an inversed version (-) of the respective component of the input signal (DATA).